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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/635,109 08/09/00 AIKAWA

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EXAMINER

MM91/0905

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STAHL, M

ART UNIT

PAPER NUMBER

2874

DATE MAILED:

09/05/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/635,109

Applicant(s)

AIKAWA ET AL.

Examiner

Mike Stahl

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-7, 11, 13, 15 and 16 is/are rejected.
- 7) ☒ Claim(s) 5, 6, 8-10, 12 and 14 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on ____ is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). ____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3,5. 6) ☐ Other: .

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

2. The documents submitted October 10, 2000 and January 16, 2001 have been considered and made of record. Initialed copies of form PTO-1449 are attached.

Claim Objections

3. Claims 5, 6 and 10 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Claims 5 and 6 both specify that the effective core area is $120\text{ }\mu\text{m}^2$ or more, but this is already recited in claim 1. It is suggested that this limitation be removed from claims 5 and 6. Claim 10 recites that Δ_2 is between -0.05 to -0.15% or less, but this range is already covered in claim 8. It is suggested that claim 10 be deleted.
4. Claim 14 is objected to because of the following informalities. In line 16, r_4 should be r_1 . Appropriate correction is required.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

6. Claims 1-6 and 11 are rejected under 35 U.S.C. 102(b) as being anticipated by Liu (US 5781684, cited by applicant).

7. Liu discloses in fig. 7 a refractive index profile for a single mode optical fiber which meets the limitations of claims 1 and 11. As indicated at col. 9 lines 55-67, the effective core area for this profile is $210 \mu\text{m}^2$, which satisfies the core area requirements of claims 1 and 2. As for claims 3 and 4, the fibers taught by Liu have a bend loss of at most 0.10 dB for 100 turns about a 75 mm diameter spool (col. 3 lines 20-27; this is a total length of about 23.5 m), which is clearly within the claimed ranges. Regarding claims 5 and 6, the sandpaper tension winding test described in the application is not an industry standard test, or at least is not one which is used at Corning, so of course Liu provides no disclosure of the results for this particular test. However, it is noted that Corning employs its own microbending test which involves winding a fiber around an array of narrow diameter pins and applying suitable tension (col. 2 line 60 – col. 3 line 5). It is asserted that the fibers disclosed by Liu have adequate microbending loss performance and that they would perform as required by claims 5 and 6.

8. Claims 1 and 3-7 are rejected under 35 U.S.C. 102(e) as being anticipated by Liu et al. (US 5835655, cited by applicant).

9. A single mode fiber having the core profile in fig. 4 satisfies the requirements of claim 1. In particular, the profile for the second comparative calculation for example 4 (col. 7 line 48 –

col. 8 line 41) has an effective area of $120 \mu\text{m}^2$ as required by claims 1 and 5-7. Liu does not provide results of bend loss tests in this patent, but merely states that a “good bending resistance” is maintained. Accordingly, it is considered inherent that the Liu fibers satisfy the bending loss requirements of claims 3-7.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 13, 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liu (US 5781684, cited above) in view of Antos et al. (US 5999679).

12. Liu does not disclose any particular dispersion compensating system for use with the described fibers. Antos discloses dispersion compensating fibers which have effective areas large enough to avoid undesirable nonlinear effects for high power signals. It would have been obvious to a person having ordinary skill in the art to use the Antos dispersion compensating fibers since Liu is concerned with providing large effective area fibers to support higher optical power levels, and since the Antos fibers having a reasonably large effective area would be able to compensate the dispersion in a long length of the Liu fibers without limiting the power levels of the whole system (col. 2 lines 15-47). Note that Antos prefers to insert the compensating fiber at the downstream end of the link, if the effective area of the dispersion compensating fiber is less than that of the primary fiber (col. 2 lines 30-33). Accordingly, an optical transmission

system using the Liu fiber as a primary fiber and the Antos fiber as a dispersion compensating fiber as suggested above, would have satisfied the requirements of claim 13. As for claim 15, Antos describes embodiments in which the effective area is at least $30 \mu\text{m}^2$ (claims 3 and 5). Regarding claim 16, since the purpose of including a dispersion compensating fiber is to reduce the overall dispersion of a transmission link to acceptable levels, it would have been obvious to a skilled artisan to determine what levels of net dispersion are acceptable for a given system and to adjust the respective lengths of the primary or dispersion compensating fibers accordingly (col. 4 lines 1-14).

13. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Allowable Subject Matter

14. Claims 8-10, 12 and 14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims, and suitably amended to overcome the earlier objections to claims 10 and 14. Of the references of record which have the high effective core area

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required by claim 1, none of these references disclose core profiles which fall into the ranges dictated by claims 8-10 and 12. As for claim 14, Antos fails to disclose a dispersion compensating fiber having the claimed core profile and dispersion values.

Conclusion

15. Any inquiry concerning this communication should be directed to Mike Stahl at (703) 305-1520. Inquiries of a general or clerical nature (e.g., a request for a missing form or paper, etc.) should be directed to the Technology Center 2800 receptionist at (703) 308-0956 or to the technical support staff supervisor at (703) 308-3072.


Rodney Bovernick
Supervisory Patent Examiner
Technology Center 2800

MJS

Michael J. Stahl
Patent Examiner
Art Unit 2874

August 29, 2001